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ABSTRACT

The space availability in public school vocational education facilities in Wyoming was determined and evaluated. Results were based on teacher response. The service areas involved were vocational agriculture, business and office education, health occupations education, home economics education, marketing and distributive education, and trade and industrial/industrial arts education. Evaluation was based on facility size recommendations communicated in policies and standards manuals for each vocational education service area. Over 75 percent of the vocational agricultural and business and office education teachers reported an adequate number of classroom student stations. A substantial number of teachers in other service areas indicated an inadequate number. Less than one-half of the respondents in vocational agriculture, home economics education, health occupations education, and marketing and distributive education indicated having an adequate teacher office/work area. Over 50 percent of the business and office education and trade and industrial/industrial arts education teachers stated they had adequate storage space. All other service areas indicated a need for more storage space. Accommodations for handicapped students were found to be inadequate. Approximately one-half of all teachers in all service areas indicated a need for facility remodeling. (The survey is appended.) (YLB)

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SPACE AVAILABILITY IN WYOMING'S VOCATIONAL EDUCATION FACILITIES

by

Susan K. Ryan

A Thesis

Submitted to the Department

of Vocational Education and to the

Graduate School of the University of Wyoming

in Partial Fulfillment of the Requirements for the

Degree of Master of Science

University of Wyoming

Laramie, Wyoming

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Consideration was given to the square footage available in vocational education classrooms and laboratory/shops. The adequacy of the following facility variables was addressed: number of student stations, teacher office/work area, storage space, and accommodation of handicapped students. Evaluation was based on present Policies and Standards for vocational education in Wyoming.

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CHAPTER I

INTRODUCTION

The large number of high school students electing not to continue on to college, combined with the influx of industrial diversification in Wyoming, has placed increasing demands on existing and projected vocational facilities.

The state legislature identified the needs of local school districts for building construction and addressed the concern through the School District Capital Construction Entitlements (21-15-101), in 1977. (18:78) Before the benefits of this legislation can have an impact on updating existing vocational facilities and constructing new facilities, more information is needed as to the present status of Wyoming's vocational facilities and the recommended facility specifications for each service area.

Personnel involved in vocational education are concerned with providing quality programs for all vocational students. Through a combined effort of Wyoming's vocational teachers, the Vocational Unit of the State Department of Education, and the Department of Vocational Education at the University of Wyoming; Program Standards of Excellence for each service area have been or are being compiled.

Recommendations for vocational facilities constitute an important element of a service area's Program Standards of Excellence, as vocational education strives to create the proper environment for the

development and evolution of quality vocational programs which can meet the demands of a changing society.

The amount of space available to a vocational service area is one component of facility specifications. Evaluation of the space available for classroom instruction, laboratory experience, storage and instructor activities should be based on established specifications particular to each service area.

Statement of the Problem

The problem of this study was to determine and to evaluate, based on existing standards when available, the space availability in public school vocational education facilities throughout the State. Results were based on teacher response. The service areas involved in the study were: Vocational Agriculture, Business and Office Education, Health Occupations Education, Home Economics Education, Marketing and Distributive Education, and Trade and Industrial Education/Industrial Arts Education.

Sub-problems include:

1. What is the average square footage per student available in classrooms?
2. What is the average square footage per student available in labs/shops?
3. Are adequate numbers of student stations provided in the classroom and in the laboratory/shop/
4. Is adequate storage space provided?
5. Is a teacher office/work area available and adequate?
6. Will the facility accomodate handicapped students?

7. Do remodeling needs exist? What are these needs?
8. What facility specifications are presently communicated in each service area's Program Standards?

Importance of the Study

The need for this study was identified by the Vocational Unit of the Wyoming State Department of Education, the Department of Vocational Education at the University of Wyoming and the Wyoming Vocational Asso-cia-tion.

The objectives of the study were:

1. To ensure that facility specifications were included in each service area's Program Standards of Excellence.
2. To determine the existing space avilable in public school vocational facilities.
3. To evaluate existing space availability based on the recommended specifications.

Results of the study will provide data relative to the existing public school vocational facilities in Wyoming. Evaluation of the data will assist in the upgrading or planning of vocational facilities.

Procedure

A committee composed of a representative from each service area devised the statistical survey to be used for data collection. The survey instrument was mailed to each public school vocational program in the State during the Fall of 1980. Surveys were returned to respective service area committee members with each committee member conducting a follow-up on those not returned using a second letter and a phone call. A second phone call follow-up was conducted in the Spring of 1981.

State foundation form applications for 1979-80 were analyzed to determine the average number of students per class in each responding program. Committee members then tabulated the average square footage available per student in both classrooms and in labs/shops. All other sub-problem tabulations were conducted at the University of Wyoming in the Spring of 1981.

Standards for vocational facilities in Wyoming were considered using the existing Policies and Standards for each area. Facility planning guidelines from other states were also reviewed and findings from both were incorporated into recommended space requirements to be included in each service area's Program Standards of Excellence. Staff members from the Vocational Unit of the State Department of Education, the Department of Vocational Education at the University of Wyoming, and members of the Wyoming Vocational Association approved recommended specifications to be used for evaluation.

A review of pertinent literature was accomplished to determine what efforts had been conducted in the area of space requirements for vocational education facilities and to establish a base for support of this project.

Limitations

Limitations of this study were as follows:

1. Evaluation was limited to public school vocational programs in the State during the 1979-80 academic year.
2. The survey instrument was a mail questionnaire completed by vocational teachers.

3. Evaluation of available space in Trade and Industrial Education and Industrial Arts Education was combined.
4. Definition of a handicapped student was left to the perception of the teacher.

Definition of Terms

Facility (vocational) - instructional and auxiliary rooms appropriate for the application of principles of instruction. Includes classrooms, labs/shops, teacher work areas and storage areas.

Program Standards of Excellence - guidelines which denote the superior components particular to each service area. The Program Standards communicate specifications for elements such as: philosophy, goals and objectives, personnel, facilities and equipment, and evaluation.

Quality Vocational Program - a sequence of courses which satisfy recommendations in a service area's Program Standards of Excellence and meet the vocational needs of students and community in a given school district.

School District Capital Construction Entitlements - capital construction funds paid to school district by the State Department of Education based on the following formula: Classroom Units x $4,500 (1980), then subtract 4 mills (.004) x current assessed valuation of the district. The difference (if any) represents the district's entitlement. These funds are provided through the permanent Wyoming mineral trust fund.

Service Area - the vocational preparation areas involved include: Vocational Agriculture, Business and Office Education, Health

Occupations Education, Home Economics Education. Marketing and Distributive Education, and Trade and Industrial/Industrial Arts Education.

Vocational Education Program - a sequence of courses, provided to students who are in grades 7 through 12, in a particular service area such as: Vocational Agriculture, Business and Office Education, and Health Occupations.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

Charles A. Prosser, (12:1) while he was serving as the first national director of Vocational Education, addressed the need to consider vocational education facilities in one of his sixteen theorems on vocational education.

> Vocational Education will be efficient in proportion as the environment in which learners are trained is a replica of the environment in which they must subsequently work.

This theorem dictates that the kinds, amount, use, and arrangement of space, materials, equipment, and supplies for a vocational preparatory program should be a replica of that in the employment setting. This becomes crucial as vocational educators strive to avail quality vocational education programs for the preparation of the future work force.

Purpose

The literature reviewed in this chapter supports the evaluation of the space availability in Wyoming's vocational education programs. As a component of facility specifications, the amount of space available for a vocational education program directly relates to the quality of the instructional program.

Facilities

Wyoming's Vocational Educators (5:6-7) defended the need for effective program facilities in the following basic principles of vocational education:

> Vocational training for jobs should be carried on in the same way with the same operations, tools, and equipment utilized in the occupation itself;

and

> Vocational Education programs provide related instructional activities, shop and/or laboratory experiences, and supervised occupational experiences of sufficient scope, level, and duration to insure adequate preparation for the student to enter employment in skilled, semi-skilled, or technical occupations.

The Wyoming Legislature, (18:69,70,78) realizing the needs of local school districts for building construction and renovation, has provided the following funding sources for capital construction: (21-13-501) Building Fund and Reserve fund; (21-13-504) Special Reserve Fund; (21-13-701) Bond Issues: and (21-15-101) School District Capital Construction Entitlement.

In discussing the status of Wyoming's vocational education facilities, the Wyoming Vocational Association Legislative Committee (26:5) reported:

> The average age of vocational facilities is fifteen years, and approximately thirty-six percent are not in compliance with OSHA standards in terms of health and safety for students, and fifty percent of the facilities are inadequate for serving the needs of students.

One of the 1980 recommendations of the Wyoming State Advisory Council for Vocational Education was to continue implementing the state-wide monitoring/evaluation system for vocational programs. (17:1)

In relation to secondary program evaluation, the Council (17:3) stated:

> In order to meet federal regulations and provide state staff with greater detail about vocational programs, the program monitoring procedures are being revised. The new procedures will include such items as square feet per student, safety factors, and classroom size in relationship to number of students. However, before an effective evaluation and monitoring system can be put into place, Program Standards and objectives must be identified for each vocational program service area.

Through the process of developing minimum program Policies and Standards for each service area and developing Program Standards of Excellence for Wyoming Vocational Education, the element of recommended facility specifications was considered essential to obtaining quality in vocational education programs.

Facility specifications recommended in a service area's Policies and Standards provide the basis for local programs to build upon. The Center for Vocational and Technical Education at Ohio State University (15:2) maintains that specific facility planning guides assist the local district in providing facilities which will enhance the quality of vocational programs.

> Thorough analysis of the desired activities and the translations of these program elements into detailed written educational specifications can contribute to the development of more functional facilities which will better meet current and changing program needs. Research and experience have shown that planning manuals and adequate guide materials improve the quality of educational specifications and the resulting physical facilities. Such planning guides help the educational planner to organize the necessary data in order to communicate better the program needs to the architect. Planning guides prevent important considerations from being overlooked and architects welcome the resulting complete education specifications.

The need for local level input must be considered as facility planning guidelines are developed. When only a list of numerical stan-

dards and requirements are given, local districts are limited rather than stimulated. (15:25) On the other hand facility recommendations can be too general. Rather than designate a need for adequate space, recommended specifications should give some suggestion of how large an area should be, how many there should be and like information. (15:26)

When reviewing vocational education facilities in relation to space, a differentiation between the educational program and the curriculum must be made. According to Castaldi (3:3) "the program determines the number and type of spaces needed, but the curriculum dictates the specific features instructional and supplementary spaces must include."

Classroom Space

Classrooms are important centers for many learning activities in a vocational program. Much classroom instruction provided in vocational programs requires extensive use of handbooks, reference books, and other items of equipment. The necessity for good student work space with opportunity to spread out the work often requires the use of tables. Space calculations for vocational classrooms should be made accordingly. (9:31)

Minimum space recommendations which have been communicated for classrooms in Wyoming vocational education programs follow. A minimum of 600 square feet is recommended for a Health Occupations classroom which is separate from the Health Occupations laboratory. (20:9) Vocational Agriculture standards suggest 900 square feet of classroom space for each teacher. (25:32) Industrial Arts Education standards recommend 400 square feet of classroom space, (23:10) and a classroom

which provides a minimum of 35 square feet per student is designated for Distributive Education. (5:40)

Laboratory Space

Vocational Education programs devote a good deal of laboratory space to courses requiring relatively large amounts of floor area for equipment and work space. The square footage for any given shop or laboratory must accomodate the largest group to be served by the facility. No rule of thumb concerning square feet per student can be advanced because the various occupational offerings in vocational education require different amounts of work area per student. (9:18)

Wyoming Policies and Standards for certain individual vocational education service areas recommend minimum specifications for the size of laboratory or shop areas. The minimum recommendation for a laboratory in Health Occupations Education was 600 square feet. (20:10) Minimum standards for an Agriculture Production Shop are: 3,000 square feet with a 50-foot width minimum and a 60-foot length, a 14' by 14' door with a walk-in door adjacent and a required exhaust system. (25:32) Graphic Arts, Woods and Metals laboratories have a space recommendation of 2,400 square feet. (23:11) The 1976 Vocational Education: Program Standards for Quality (5:30) suggests 900 square feet of laboratory space for a Distributive Education program. A maximum of four students per foods laboratory station was advised in Home Economics. (5:60)

Teacher Office/Work Area

Allen (15:81) in addressing the aspect of teacher office space, said that the teacher's base of operation should be an office, not a

classroom standing empty during a preparation period.

> Teacher offices are long overdue. If we expect teachers to act as professionals, to engage in the individualization of instruction, and to confer with students, space must be provided. The teacher needs a private office to prepare materials which will be presented in a specialized facility designed to make that presentation most effective. (15:84)

A more negative view of faculty offices was expressed by Nerden (9:24):

> It may be actually inadvisable for an instructor to have an office immediately adjacent to or even enclosed within the laboratory or shop. Should an accident occur while the instructor is otherwise engaged in an adjacent office, it may be successfully argued that the student was not under direct supervision; hence the instructor could be deemed liable.

Further, Nerden believes that separate faculty offices may have a detrimental effect on the quality of the instructional program. He affirms that when a class tends to be continuous over a three or four hour period, the instructor might withdraw from the teaching situation while attending to other responsibilities. The elimination of separate office space, according to Nerden, would permit the instructor to be present in the shop or laboratory on a full time basis, thus contributing to the quality of instruction.

Office space recommendations for some vocational service areas are communicated in Vocational Education: Program Standards for Quality and in individual service area Policies and Standards handbooks. Health Occupations Education recommends 100 square feet of teacher office space. (20:10) Vocational Agriculture suggests 120 square feet plus 60 square feet per additional teacher. (25:32) One hundred square feet and 120 square feet of teacher office space is recommended for Indus-

trial Arts Education (23:10) and Trade and Industrial Education respectively. (24:15) Distributive Education proposes 150 square feet of teacher office space. (22:19)

Storage Space

Equipment and supplies unique to each vocational service area bring about special considerations for storage space in the vocational education facility. Valentine (15:26), in writing the Vocational-Technical Facilities Project Report, stated: "The amount of storage space recommended would be based upon what is going to be stored, how large it should be, how many there are, and like information."

Handicap Accomodation

The Architectural and Transportation Barriers Compliance Board (1:1) presented the following view of the problems that handicapped persons constantly confront:

> Approximately 22 million people, or 10 percent of the entire population in the United States have physical impairments which restrict them from normal daily activities. For the most part, they are a hidden population, isolated in a household environment and restricted from contributing their talents as active members of the community. One of the major obstacles to their participation in societal endeavors is the physical design of our man-made environment. The transportation systems, buildings, and facilities that are an integral part of our urban environments are designed and built to accommodate only a portion of its residents--the physically unimpaired.

The Rehabilitation Act of 1973 (Public Law 93-112) and the Education for All Handicapped Children Act of 1975 (Public Law 94-142) are two important acts of federal legislation which focus attention on the education of handicapped students. Both laws put special emphasis on

the need for facilities to be made accessible to the handicapped if they are to be assured of equal educational opportunities.

Some changes in existing facilities are probably needed in school districts so that handicapped students may be integrated into educational facilities with nonhandicapped students. Section 504 of The Rehabilitation Act of 1973, Subpart C, (7:1) addresses facility accessibility for handicapped persons:

> Section 84.21 Program Accessibility
>
> No qualified handicapped person shall, because a recipients facilities are inaccessible to or unusable by handicapped persons, be denied the benefits of, be excluded from participation in, or otherwise be subjected to discrimination under any program or activity. . .
>
> Section 84.22 Existing Facilities
>
> a. A recipient shall operate each program or activity to which this part applies so that the program or activity, when viewed in its entirety, is readily accessible to handicapped persons. This paragraph does not require a recipient to make each of its existing facilities or every part of a facility accessible to and usable by handicapped persons.
>
> b. A recipient may comply with the requirements of paragraph (a) through such means as redesign of equipment, reassignment of classes or other services to accessible buildings, assignment of aides to beneficiaries, home visits, delivery of health, welfare, or other social services at alternate accessible sites, alteration of new facilities in conformance with the requirement of Section 84.23. . .
>
> d. A recipient shall comply with the requirements of paragraph (a) of this section within sixty days of the effective date of this part except that where structural changes in facilities are necessary, such changes shall be made within three years of the effective date of this part, but in any event as expeditiously as possible.
>
> Section 84.23 New Construction
>
> Each facility or part of a facility constructed by, on behalf or, for the use of a recipient shall be designed and constructed in such manner that the facility or part of the facility is readily

> accessible to and usable by handicapped persons, if the construction was commenced after the effective date of this part.

As the regulations state, it is not required that every part of a facility be made accessible to handicapped students. It is required, however, to achieve program accessibility for the maximum number of handicapped students possible (6:4)

Summary

Effective facilities are an integral element in a quality vocational program. The space available in the facilities has a direct relationship to the extent in which the facility can replicate the employment setting. Vocational education opportunities, for all students, are enhanced or inhibited dependent, in part, upon the physical environment.

CHAPTER III

DISCUSSION AND PRESENTATION OF DATA

Introduction

Vocational educators concerned with providing quality programs for all vocational students have been recently or are presently involved in developing Program Standards of Excellence for each service area. Recommended facility specifications are an integral part of these Standards of Excellence. Included in facility specifications are recommendations for the size of classrooms, laboratory/shops, storage areas and instructor office/work areas.

Data collected in this study provide vocational educators with pertinent information as to the present space available in Wyoming's vocational education facilities for planning and evaluation purposes.

The average number of students in each class was obtained from the 1979-1980 State Foundation forms at the State Department of Education. A Wyoming Vocational Education Association committee, representing each service area, tabulated the average square footage available per student in both classrooms and laboratories/shops. All other tabulations and the analyses of data were conducted at the University of Wyoming.

Programs

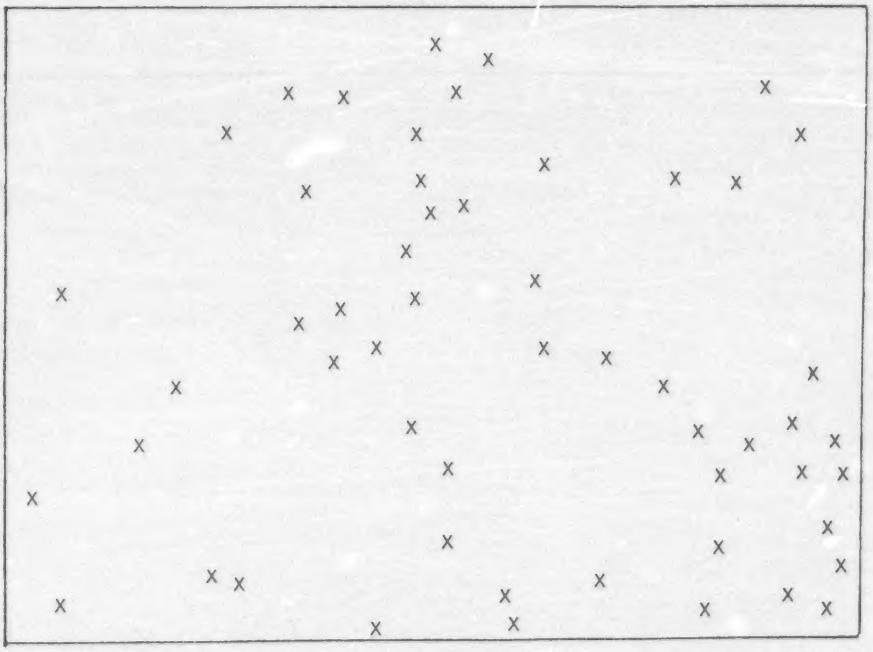
A statistical survey instrument was composed by the Wyoming Vocational Education Association committee and was mailed to a teacher

in each public school vocational education program in Wyoming during the fall of 1980.

The geographical distribution of those vocational education programs which participated in this study is shown in Figure 1.

FIGURE 1

GEOGRAPHICAL DISTRIBUTION OF PARTICIPATING SCHOOLS



Teachers from 98 vocational education programs responded to the mail survey or the follow-up and are reported in Figure 2.

FIGURE 2

NUMBER OF PROGRAMS INVOLVED IN EACH VOCATIONAL EDUCATION SERVICE AREA

Service Area	Number of Programs
Vocational Agriculture	13
Business and Office Education	26
Health Occupations Education	3
Home Economics Education	27
Marketing and Distributive Education	13
Trade and Industrial/Industrial Arts Education	16
TOTAL	98

Home Economics teachers reported 27 program facilities in the study, while 26 Business and Office Education facilities were included. Trade and Industry and Industrial Arts Education programs were combined to make a total of 16 facilities represented in the data. Teachers in Vocational Agriculture and Marketing and Distributive Education provided information on 13 program facilities in each area. Health Occupations Education had three programs described for the facilities study.

Vocational Agriculture

Classroom Space Available. Teachers from 13 vocational agriculture programs responded to the facilities survey as shown in Table I. Two teachers reported over 1,000 square feet available in the classroom. All other programs had from 520 to 896 square feet of classroom space. The mean square footage for vocational agriculture classrooms was 745. Two of the 13 programs met the recommended minimum standard of 900 square

TABLE I

CLASSROOM SPACE AVAILABLE
VOCATIONAL AGRICULTURE

School Number	Average Number of Square Feet Per Classroom	Average Number of Students Per Class	Average Number of Square Feet Available Per Student**
1	750	18	42
2	800	11	73
3	800	9	89
4	600	8	75
5	896	15	60
6	600	13	46
7	600	14	43
8	630	12	53
9	640	11	58
10	1,050	12	88
11	520	12	43
12	560	10	56
13	1,238	15	83
Standard*	900	--	--
Mean	745	12	62

*From Wyoming Vocational Agriculture Policies and Standards

**Figures have been rounded to the nearest whole number.

feet in the vocational agriculture classroom. The average number of students per class in the 13 programs ranged from a low of 8 to a high of 18 with the mean being 12. Tabulations of average square footage available per student indicated that five programs were above the mean of 62 square feet per student. The average square footage available per student ranged from a high of 89 to a low of 42.

Laboratory/Shop Space Available. Table II reflects the reported lab/shop space available in each vocational agriculture program. The average shop space available for the thirteen programs was 3,563 square feet, with a low of 1,440 square feet and a high of 5,400 square feet. Wyoming Policies and Standards for Vocational Agriculture recommends 3,000 square feet for the lab/shop area. Five of the thirteen programs indicated lab/shop areas less than 3,000 square feet. The average amount of space available per student in the shop area ranged from 111 square feet to 437 square feet, with a mean of 296 square feet per student.

Adequacy of Facilities. Table III (page 22) addresses the adequacy of the following vocational agriculture facility variables: number of student stations, teacher office/work area, storage, and handicap accomodation. Ten or 77 percent of those responding expressed that the number of student stations in their classrooms was adequate. Three or 23 percent were of the opinion that their facility had an inadequate number of classroom student stations. In response to the adequacy of the number of student stations in the lab/shop area, 46 percent of 6 of those responding

TABLE II

LABORATORY SPACE AVAILABLE
VOCATIONAL AGRICULTURE

School Number	Average Number of Square Feet Per Lab/Shop	Average Number of Students Per Lab/Shop	Average Number of Square Feet Available Per Student**
1	5,040	18	280
2	2,000	11	182
3	2,400	9	267
4	3,200	8	400
5	5,600	15	373
6	1,440	13	111
7	2,200	14	157
8	2,907	12	242
9	4,056	11	369
10	5,400	12	450
11	3,800	12	317
12	4,368	10	437
13	3,906	15	260
Standard*	3,000	--	---
Mean	3,563	12	296

*From Wyoming Vocational Agriculture Policies and Standards

**Figures have been rounded to the nearest whole number

TABLE III

ADEQUACY OF FACILITY VARIABLES
VOCATIONAL AGRICULTURE

	Yes (Adequate)		No (Inadequate)	
	Number Responding	%	Number Responding	%
Number of Classroom Student Stations	10	77	3	23
Number of Laboratory/Shop Student Stations	6	46	7	54
Teacher Office/ Work Area	5	38	8	62
Storage	7	27	19	73
Handicap Accomodations	7	54	6	46

stated that they did have an adequate number of student stations; whereas, 54 percent or 7 believed that the number of student stations in the lab/shop area was inadequate. Respondents reporting that they did not have adequate teacher work areas or office space totaled 62 percent, while 38 percent found their work areas adequate.

The variable of storage space was the most prevalent problem expressed in the facility findings. Of those responding, 73 percent

stated that their facility did not have adequate storage space. The remaining 27 percent reported having adequate storage for their program needs.

Approximately one half of those responding to the survey reported having a facility that would accomodate handicapped students. Seven or 54 percent indicated that their facility would accomodate handicapped students and six or 46 percent disclosed that handicapped students could not be accomodated in their facility.

Business and Office Education

Classroom Space Available. Data from 26 business and office education programs are shown in Table IV. The mean for classroom space available in the business and office education programs responding was 848 square feet per classroom. Six of the 26 programs reported available classroom square footage of over 1,000 and three programs reported having less than 500 square feet available in the classroom. Fifteen of the programs fell into the range of 500 to 999 square feet. The Wyoming Policies and Standards Handbook for Business and Office Education does not recommend any square footage figures for facilities.

The average number of students per class in the 26 programs was 15, with a high of 24 students per class and a low of 9. The mean amount of space available per student for all responding programs was 64 square feet. Square footage available per student ranged from a low of 19 to a high of 134. Nine programs reported available square feet per student of under 50 and four programs reported an available square footage of 100 or above. With the exception of schools number

TABLE IV

CLASSROOM SPACE AVAILABLE
BUSINESS AND OFFICE EDUCATION

School Number	Average Number of Square Feet Per Classroom	Average Number of Students Per Class	Average Number of Square Feet Available Per Student**
1	516*	15	34
2	333*	18	19
3	495*	11	45
4	806*	18	45
5	875*	11	80
6	1,107*	13	85
7	390	9	43
8	1,305*	13	100
9	776*	12	65
10	702	10	70
11	2,000*	17	118
12	750*	22	34
13	999*	24	42
14	672	20	34
15	477*	11	43
16	600*	9	67
17	1,000*	14	71
18	672*	5	134
19	600*	10	60
20	745*	6	124
21	875*	16	55
22	900	19	47
23	845*	17	50
24	1,270	19	67
25	773*	21	37
26	1,575*	17	93
Mean	848	15	64

*Classroom and laboratory area is one in the same.

**Figures have been rounded to the nearest whole number.

4, 7, 10, 14, 22, and 24 all the reported square footage figures in Table IV serve as both the business and office education classroom and laboratory.

Laboratory Space Available. Business and office education programs reporting laboratories in addition to classrooms are shown in Table V. For the six schools reporting business and office education laboratories in addition to classrooms, 688 square feet was the average amount of space available in these labs. Two hundred square feet was the low reported and 1,200 square feet in a lab was the reported high. These programs reported an average of 16 students per class, with a high of 19 and a low of 9.

Average square footage per student available in these six business and office education programs was 46. A range of a low 11 square feet per student to a high 70 square feet per student is shown.

Adequacy of Facilities. The adequacy of the following variables for business and office education is shown in Table VI (page 27): number of student stations, teacher office/work area, storage, and handicap accomodation. Of the business and office teachers who responded, 78 percent indicated that they had an adequate number of student stations in their classrooms. Another 22 percent reported that the number of classroom student stations in their program was inadequate. A total of 64 percent expressed the opinion that the number of student stations available to them in their laboratories was adequate, with 36 percent expressing that their number of laboratory student stations was inadequate.

TABLE V

LABORATORY SPACE AVAILABLE
BUSINESS AND OFFICE EDUCATION

School Number	Average Number Of Square Feet Per Laboratory	Average Number of Students Per Lab	Average Number Of Square Feet Available Per Student*
4	806	18	45
7	420	9	47
10	702	10	70
14	798	20	40
22	200	19	11
24	1,200	19	63
Mean	688	16	46

*Figures have been rounded to the nearest whole number.

Slightly over half or 56 percent of the teachers responding believed that their office/work area was adequate. The remaining 44 percent said that they needed more space.

Approximately two-thirds, 64 percent of the teachers, were of the opinion that the storage space in their facilities was adequate. Inadequate storage space was reported by 35 percent.

Of the facilities represented in the study, 64 percent will accomodate handicapped students and 36 percent of the business and

TABLE VI

ADEQUACY OF FACILITY VARIABLES
BUSINESS AND OFFICE EDUCATION

	Yes (Adequate)		No (Inadequate)	
	Number Responding	%	Number Responding	%
Number of Classroom Student Stations	53	78	15	22
Number of Laboratory Student Stations	7	64	4	36
Teacher Office/ Work Area	10	56	8	44
Overall Storage	55	65	29	35
Handicap Accommodations	23	64	13	36

office education facilities represented will not accommodate handicapped students.

Health Occupations Education

Due to the infancy of Health Occupations Education Programs in the State, most existing programs are utilizing community facilities

as their classrooms and laboratories. All teachers responding indicated a need for the integration of health occupations facilities as a part of the total school facility.

One teacher reported a combination laboratory/classroom area of 500 square feet. Another reported no facilities other than the community hospital. The third respondent indicated an average of 270 square feet of classroom/laboratory space and use of community hospital facilities.

All stated that a teacher/office work area for Health Occupations Education was nonexistent. The consensus was that all programs had inadequate storage space. None of the programs meet the Wyoming Health Occupations Policies and Standards recommendations of a minimum 600 square feet per classroom and 600 square feet per laboratory.

Home Economics Education

Classroom Space Available. Table VII represents classroom space data provided from 26 home economics programs in the State.

The average amount of classroom space available when all 26 responding programs were considered was 951 square feet. For seventeen of the programs reported in Table VII classroom space and laboratory space are one in the same. The lowest reported classroom space was 341 square feet with the highest being 2,600 square feet. The 341 square foot room also serves as a laboratory; whereas, the 2,600 square foot room does not. Five of the programs fell in the range of 300 to 600 square feet of classroom space. Twelve programs had between 600 and 900 square

TABLE VII

CLASSROOM SPACE AVAILABLE
HOME ECONOMICS EDUCATION

School Number	Average Number of Square Feet Per Classroom	Average Number of Students Per Class	Average Number of Square Feet Available Per Student**
1	1,458*	7	208
2	1,200	14	86
3	1,350	15	90
4	618*	8	77
5	810*	18	45
6	2,533*	19	81
7	667*	11	61
8	1,248*	9	139
9	540*	11	49
10	640	10	64
11	732*	11	67
12	850*	9	84
13	743	17	44
14	900*	13	69
15	648	18	36
16	1,248*	21	59
17	1,250*	11	114
18	964	17	57
19	480	27	18
20	2,600	14	186
21	798*	8	100
22	341*	9	38
23	1,386*	13	107
24	930*	15	62
25	750*	12	63
26	540*	18	30
27	440	13	34
Mean	951	14	77

*Classroom and laboratory space is one in the same.

**Figures have been rounded to the nearest whole number.

feet of classroom space and nine teachers reported over 900 square feet of classroom space.

Fourteen was the mean number of students per home economics class for the twenty-six programs. Eight and twenty-seven were the lowest and highest number of students per class, respectively.

The average square footage available per student for the 26 reported programs was 77 with a range of 30 square feet per student to 208 square feet per student. The Wyoming Policies and Standards Handbook for Home Economics Education does not have minimum square footage recommendations.

Laboratory Space Available. Figures for those home economics programs reflecting laboratory space in addition to classroom space are disclosed in Table VIII.

Nine respondents indicated having home economics laboratory space separate from and in addition to classroom space. The lowest amount of laboratory space revealed from these nine programs was 600 square feet with the highest being 2,160 and the mean for the nine programs being 988 square feet.

The mean number of students per class for these programs was 16 with a high of 27 and a low of 10. Square feet available per student ranged from 40 to 120 with 61 as the mean.

Adequacy of Facilities. Home Economics facility variables addressed in Table IX (page 32) include the adequacy of: number of student stations, teacher office/work area, storage and handicap accomodations. Of those repsponding, 64 percent stated that the number of student stations in both their home economics classrooms and laboratories was adequate.

TABLE VIII

LABORATORY SPACE AVAILABLE
HOME ECONOMICS EDUCATION

School Number	Average Number of Square Feet Per Laboratory	Average Number of Students Per Laboratory	Average Number of Square Feet Available Per Student*
2	600	14	43
3	600	15	40
10	400	10	40
13	1,080	17	64
15	2,160	18	120
18	1,091	17	64
19	1,000	27	37
20	1,000	14	71
27	960	13	74
Mean	988	16	61

*Figures have been rounded to the nearest whole number.

Another 36 percent reported an inadequate number of student stations in classrooms and laboratories.

A need for more teacher office/work space was expressed by 62 percent of the home economics teachers, while 38 percent found their work areas adequate.

TABLE IX

ADEQUACY OF FACILITY VARIABLES
HOME ECONOMICS EDUCATION

	Yes (Adequate)		No (Inadequate)	
	Number Responding	%	Number Responding	%
Number of Classroom Student Stations	56	64	32	36
Number of Laboratory Student Stations	23	64	13	36
Teacher Office/ Work Area	12	38	20	62
Overall Storage	64	45	77	55
Handicap Accommodations	17	38	28	62

Storage space in the home economics programs received an adequate rating from 45 percent of those responding while 55 percent indicated that storage space in their facility was inadequate. Home economics teachers revealed that 62 percent of the facilities represented would not accommodate handicapped students. Another 38 percent of the reported facilities would accommodate handicapped students.

TABLE X

CLASSROOM/LABORATORY SPACE AVAILABLE
MARKETING AND DISTRIBUTIVE EDUCATION

School Number	Average Number of Square Feet Per Classroom	Average Number of Students Per Class	Average Number of Square Feet Available Per Student*
1	497	13	38
2	1,200	21	57
3	988	21	47
4	800	7	114
5	875	18	49
6	540	19	28
7	625	13	48
8	1,050	21	50
9	681	12	57
10	552	18	31
11	1,500	15	100
12	552	22	25
13	900	16	56
Standard	--	--	35*
Mean	828	17	54

*From 1976 Vocational Education Program Standards for Quality
**Figures have been rounded to the nearest whole number.

Marketing and Distributive Education

Classroom/Laboratory Space Available. Thirteen Marketing and Distributive Education Programs were included in tabulations for this study as shown in Table X. Respondents indicated a low of 497 and a

high of 1,500 square feet available in the distributive education classroom/laboratory. The mean for the 13 programs which were included was 828 square feet.

The recommended standard for a Marketing and Distributive Education classroom/laboratory is 35 square feet per student. Three of the programs reported did not meet this standard.

The average number of students per class for the 13 programs was 17 with a range of 7 to 22. Classroom space available per student ranged from 28 square feet to 114 square feet with a mean of 54.

Adequacy of Facilities. Marketing and Distributive Education teachers rated the adequacy of the following facility variables as shown in Table XI: number of student stations, teacher office/work area, overall storage, handicap accomodations and school store. Of the respondents, 62 percent indicated that the number of student stations in their facility was not adequate, while 38 percent were satisfied with the number of student stations in their classroom.

Over three-fourths of the teachers, 77 percent, are not satisfied with the teacher/office work area in their facility. The remaining 23 percent maintain that they have an adequate amount of space for the teacher work area. Four of those responding or 31 percent reported that the storage space in their facility was adequate; whereas, nine or 69 percent expressed a need for more storage. In response to accomodating handicapped students, 29 percent said their facility would accomodate these students and 71 percent indicated that their facility would not accomodate handicapped students.

TABLE XI

ADEQUACY OF FACILITY VARIABLES
MARKETING AND DISTRIBUTIVE EDUCATION

	Yes (Adequate)		No (Inadequate)	
	Number Responding	%	Number Responding	%
Number of Student Stations	5	38	8	62
Teacher Office/ Work Area	3	23	10	77
Overall Storage	4	31	9	69
Handicap Accommodations	2	29	5	71
School Store	6	46	7	54

The school store plays an important part in the Marketing and Distributive Education curriculum. Adequate school store facilities were reported by 46 percent and 54 percent reported inadequate facilities or the complete absence of this variable.

Trade and Industrial/Industrial Arts Education

Classroom Space Available. Sixteen Trade and Industrial/Industrial Arts Education teachers provided data as shown in Table XII. Ten of these sixteen programs use the same facility space for classroom and laboratory/shop. The reported classroom space ranged from 150 square feet (used both as classroom and lab) to 4,050 square feet (also used as classroom and lab). The mean for average square feet available in the classroom was 1,456. The mean for average number of students per class was 15 with a high of 24 and a low of 7. Average square footage available per student ranged from 21 to 312 with a mean of 98. Wyoming Policies and Standards for Industrial Arts Education recommends 20 square feet per student. All identified programs met this suggested standard.

Laboratory/Shop Space Available. Six schools reported lab/shop space in addition to classroom space as shown in Table XIII (page 38). The mean for average number of square feet in the six laboratories/shops was 2,373 with a high of 5,501 and a low of 350 square feet. Wyoming Policies and Standards for Industrial Arts Education recommend 2,400 square feet of laboratory space. One-third of the programs reporting labs in addition to a classroom met this standard. Of those programs having a combined classroom/lab, 40 percent met the suggested standard.

Results show a range of 7 to 17 students per class with a mean of 13 and a range of 22 square feet to 324 square feet available per student. The mean for square footage available per student in these six programs was 181.

TABLE XII

CLASSROOM SPACE AVAILABLE
TRADE AND INDUSTRIAL/INDUSTRIAL ARTS EDUCATION

School Number	Average Number of Square Feet Per Classroom	Average Number of Students Per Class	Average Number of Square Feet Available Per Student***
1	860	7	123
2	1,333*	14	95
3	1,500*	16	94
4	3,700*	17	218
5	1,500*	16	94
6	754	16	47
7	150	7	21
8	400	16	25
9	600*	11	55
10	2,400*	17	141
11	2,500*	16	156
12	4,050*	13	312
13	1,731*	24	72
14	1,035*	15	69
15	350	16	22
16	433	17	25
Standard**	--	--	20
Mean	1,456	15	98

*Classroom are and lab/shop area is one in the same.

**From Wyoming Policies and Standards for Industrial Arts Education

***Figures have been rounded to the nearest whole number.

TABLE XIII

LABORATORY SPACE AVAILABLE
TRADE AND INDUSTRIAL/INDUSTRIAL ARTS EDUCATION

School Number	Average Number of Square Feet Per Lab/Shop	Average Number of Students Per Lab/Shop	Average Number of Square Feet Available Per Student**
1	1,467	7	210
6	4,031	16	252
7	1,200	7	171
8	1,690	16	106
1	350	16	22
16	5,501	17	324
Standard*	2,400	--	---
Mean	2,373	13	181

*From Wyoming Standards and Policies for Industrial Arts Education

**Figures have been rounded to the nearest whole number.

Adequacy of facilities. Teachers rated the adequacy of the following facility variables: number of student stations, teacher office/work area, storage and handicap accommodations. Results are shown in Table XIV. Of those responding, 70 percent were of the opinion that the number of student stations in their classrooms and in their laboratories/shops was adequate, while 30 percent reported that they did not

TABLE XIV

ADEQUACY OF FACILITY VARIABLES
TRADE AND INDUSTRIAL/INDUSTRIAL ARTS EDUCATION

	Yes (Adequate)		No (Inadequate)	
	Number Responding	%	Number Responding	%
Number of Classroom Student Stations	19	70	8	30
Number of Laboratory Student Stations	26	70	11	30
Teacher Office/ Work Area	10	67	5	33
Overall Storage	23	53	20	47
Handicap Accommodations	12	63	7	37

have an adequate number of student stations. Satisfaction with the amount of teacher office/work space available in these facilities was relatively high with 67 percent expressing that the space allowed was adequate and 33 percent indicating that more space would be desirable.

Opinions on storage availability were nearly evenly divided with 53 percent expressing satisfaction with the storage available in their

facility and 47 percent disclosing a need for more storage space. Of the Trade and Industrial/Industrial Arts Education programs, 63 percent have facilities which would accommodate handicapped students while 37 percent could not accommodate these students.

Remodeling Needs

Responses to the question of facility remodeling needs are shown in Table XV. Health Occupations Education ranked the highest in terms of remodeling needs with 100 percent of the teachers expressing the need for improved facilities for their programs. Of the Home Economics Education respondents, 59 percent indicated the need for facility remodeling. Vocational Agriculture, Marketing and Distributive Education, and Trade and Industrial/Industrial Arts Education reported facility remodeling needs of 54 percent, 50 percent and 47 percent respectively. Business and Office Education reported the lowest remodeling need with 32 percent of the teachers being of the opinion that their facility needed remodeling.

Respondents were asked to explain why their facility needed remodeling. The following were the most prevalent reasons given:

1. Need more space for students
2. Need more storage
3. Need more teacher work space
4. Need to remodel to accommodate handicapped students
5. Need to remodel to conform to safety regulations

TABLE XV

FACILITY REMODELING NEEDS

Program Area	Needs Remodeling		Does Not Need Remodeling	
	Number	%	Number	%
Vocational Agriculture	7	54	6	46
Business & Office Education	11	32	23	68
Health Occupations Education	3	100	0	0
Home Economics Education	27	59	19	41
Marketing & Distributive Education	3	50	3	50
Trade & Industrial/Industrial Arts Education	9	47	10	53

CHAPER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of the study was to determine and evaluate the space available in vocational education facilities in Wyoming. Classroom space and laboratory space were determined for programs in Vocational Agriculture, Business and Office Education, Health Occupations Education, Home Economics Education, Marketing and Distributive Education, and Trade and Industrial/Industrial Arts Education. Space available in school facilities represented in this study was then evaluated based on facility size recommendations communicated in Policies and Standards manuals for each vocational education service area. Vocational teachers were also asked to provide information relative to the adequacy of: the number of student stations in their classrooms and laboratories; the teacher office/work area; storage space available; and the ability of their facility to accomodate handicapped students. Perceptions of remodeling needs for the facility were also expressed. Ninety-eight vocational education programs in Wyoming were included in the data analyzed.

Findings

Analyses of the data collected revealed the following findings with respect to vocational education facilities in Wyoming:

1. The average square footage per studnet available in vocational education classrooms was as follows: Vocational Agriculture, 62 square feet; Business and Office Education, 64 square feet; Home Economics Education, 77 square feet; Marketing and Distributive Education, 54 square feet; Trade and Industrial/ Industrial Arts Education, 98 square feet.
2. The average square footage per student available in vocational education laboratories/shops was as follows: Vocational Agriculture, 296 square feet; Business and Office Education, 65 square feet; Home Economics Education, 74 square feet; Trade and Industrial/Industrial Arts Education, 149 square feet.
3. Over 75 percent of the teachers in Vocational Agriculture and Business and Office Education reported an adequate number of classroom student stations. A substantial number of teachers in other vocational education service areas indicated an inadequate number of classroom student stations.
4. Less than one half of the respondents in Vocational Agriculture, Home Economics Education, Health Occupations Education, and Marketing and Distributive Education indicated having an adequate teacher office/work area.
5. Over 50 percent of the Business and Office Education and Trade and Industrial/Industrial Arts Education teachers stated that storage space for their program was adequate.

All other vocational service areas indicated a need for more storage space.

6. Handicapped students can be accommodated in 54 percent of the Vocational Agriculture programs, 64 percent of the Business and Office Education programs, 38 percent of the Home Economics Education program, 29 percent of the Marketing and Distributive Education programs and 63 percent of the Trade and Industry/Industrial Arts Education programs.
7. Approximately one half of the teachers in all service areas with the exception of Business and Office Education indicated a need for some facility remodeling.

Conclusions

On the basis of the data presented in this investigation, the following conclusions appeared warranted:

1. That little attention has been given to vocational education facilities in the planning and evaluation standards in the State of Wyoming.
2. That facility modivication and adaptation to serve handicapped students in Wyoming's vocational programs has not been adequately addressed.
3. That adequate storage space is important to vocational education programs and has often been neglected in facility planning.
4. That state-wide program improvement activities are being deterred because of the difficulty in obtaining information from teachers in Wyoming.

5. That a combination of school and community facilities enhance the vocational instructional program.

Recommendations

1. Representatives from business and industry should be involved cooperatively in the planning of vocational education facilities so that resultant facilities promote an environment as near to the employment setting as possible.
2. Vocational; teachers, University of Wyoming faculty, and State Department of Education staff from the service areas of Business and Office Education, Home Economics Education and Marketing and Distributive Education should be involved in determining specific facility space guidelines to be communicated in Wyoming Policies and Standards manuals.
   a. Recommendations for space in vocational program facilities should be divided into specific instructional areas within a particular service area, i.e. instructional areas within home economics, business and office, etc.
3. Local districts with Health Occupations programs should examine the possibility of incorporating more adequate instructional environments into the public educational facility.
4. The State Department of Education, Vocational Unit should take the leadership for providing the local district with facility specifications in each vocational service area.
5. Program evaluation, including the evaluation of vocational education facilities, should be a continuing process conducted

by the State Department of Education, Vocational Unit and should be based on recommended Policies and Standards for each vocational education service area.

6. The needs for construction, improvement, and maintenance of vocaional education facilities should be appraised and then communicated to the State Legislature.
7. Further study and evaluation of Wyoming's vocational education facilities should be conducted in depth for each service area.

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APPENDIX

Facilities Study

Please complete the following items as they relate to your program.

Laboratory/Shop Areas

Size Adequate _____Yes _____No

Number of Student Stations Adequate _____Yes _____No

Average size of your shop area(s) _____ square feet
(Please add square footage of all shop areas and divide by number of rooms)

Classroom Areas

Size Adequate _____Yes _____No

Number of Student Stations Adequate _____Yes _____No

Average size of your classroom area(s) _____ square feet
(Please add square footage fo all classroom areas and divide by number of rooms)

Teacher's Office-Work Area

Size Adequate _____Yes _____No

Storage Adequate _____Yes _____No

Size _____square feet

Storage

Available _____Yes _____No

Size Adequate _____Yes _____No

Size _____square feet

Handicap Accommodations

Will your facility accommodate handicapped students? ____Yes ____No

Remodeling Needs

Do your facilities need remodeling? _____Yes _____No

If yes, please explain: _____

_____

_____

Total number of students which use your facility each day. _____

Total number of class periods your facility is used each day. _____

School Name: _____

Teacher Name: _____